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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,292	12/08/2003	Zia Hossain	ONS00478	2181

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EXAMINER	
NGUYEN, JOSEPH H	
ART UNIT	**PAPER NUMBER**
2815	

DATE MAILED: 10/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/729,292	HOSSAIN ET AL.	
	Examiner	Art Unit	
	Joseph Nguyen	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10-18 and 20* is/are rejected.

7)☒ Claim(s) *9 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 December 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/8/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "a second source region formed in the doped region, and wherein the first conductive layer is coupled to the second source region" in claim 3 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 1 is objected to because of the following informalities: --formed-- in line 11of claim 1 should be –formed in-- . Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the first major surface" in line 22. There is insufficient antecedent basis for this limitation in the claim. The term “first major surface” was not previously referred to in claim 1.

Claims 2-11 are also rejected due to their dependency upon their rejected base claim 1 above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 7-8, 10-18, 20, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al.

Regarding claim 1, Watanabe et al discloses on figure 8 a lateral FET structure comprising a body of semiconductor material 11 having a first conductivity type; a first well region 23 of a second conductivity type formed in the body of semiconductor material; a second well region 23 of the second conductivity type formed in the body of semiconductor material; a first drain contact region 24 of the second conductivity type formed in a portion of the first well region; a second drain contact region 24 of the second conductivity type formed in a portion of the second well region; a first doped region 14 of the first conductivity type formed in another portion of the body of semiconductor material adjacent to the first well region 23; a first source region 16 of the second conductivity type formed in the first doped region; a gate structure 18 formed over the first major surface; a first conductive layer 30 coupled to the first source region 16 to form a source contact; a second conductive layer 29 formed over the body of semiconductor material and coupled to the first and second drain contact regions 24; and an interlayer dielectric layer 25 separating at least a portion of the first and second conductive layers 30, 29.

Regarding claim 2, Watanabe et al discloses on figure 8 the first doped region 14 surrounds the first well region 23.

Regarding claim 3, Watanabe et al discloses on figure 8 a second source region 22 formed in the doped region 14, and wherein the first conductive layer 30 is coupled to the second source region.

Regarding claim 4, Watanabe et al discloses on figure 8 a second doped region 14 of the first conductivity type surrounding the second well region 23, and wherein the first and second doped regions are absent a fingertip region.

Note that there are two regions 23 and two regions 14 in figure 8 of Watanabe et al.

Regarding claim 7, Watanabe et al discloses on figure 8 the first and second well regions 23 are spaced apart.

Regarding claim 8, Watanabe et al discloses on figure 8 the first well region 23 includes a pair of opposing rounded tips.

Regarding claim 10, Watanabe et al discloses on figure 8 the first conductive layer 30 and second conductive layer 29 do not overlap.

Regarding claim 11, Watanabe et al discloses on figure 8 a portion of the second conductive layer 29 is over a portion of the first well region 23 and separated from the first well 23 by a dielectric layer 21.

Regarding claim 12, Watanabe et al discloses on figure 8 a lateral FET device comprising a body 11 of semiconductor material having a first conductivity type; a plurality of drain regions of a second conductivity type formed in the body of semiconductor material; a plurality of source regions of the second conductivity type formed in the body of semiconductor material; a first conductive layer 29 formed over the body of semiconductor material and coupled to the plurality of drain regions; a second conductive layer 30 formed over the body of semiconductor material and coupled to the plurality of source regions; and a dielectric layer 25 formed over the body

of semiconductor material, wherein one of the first and second conductive layers is formed over the dielectric layer.

Regarding claim 13, Watanabe et al discloses on figure 8 the plurality of drain regions comprises a plurality of well regions 23 and a plurality of drain contact regions 24, and wherein at least one drain contact region 24 is formed within one well region.

Regarding claim 14, Watanabe et al discloses on figure 8 the first and second conductive layers 29, 30 do not overlap.

Regarding claim 15, Watanabe et al discloses on figure 8 a plurality of doped regions 14 of the first conductivity type, wherein one of the plurality of source regions is within one of the plurality of doped regions, and wherein one the plurality of doped regions surrounds one of the plurality of well regions 23.

Regarding claim 16, Watanabe et al discloses on figure 8 portions of the second conductive layer 30 terminate in proximity to the first conductive layer 29.

Regarding claim 17, Watanabe et al discloses on figure 8 a method for forming a lateral FET device comprising the steps of providing a body 11of semiconductor material having a first conductivity type; forming a plurality of drain regions 23 in the body of semiconductor material; forming a plurality of source regions 14 in the body of semiconductor material; forming a first conductive layer 29 on the body of semiconductor material and coupled to the plurality of drain regions; and forming a second conductive layer 30 on the body of semiconductor material and coupled to the plurality of source regions 14, wherein at least a portion of the second conductive layer is separated from a portion of the first conductive layer by a dielectric layer 25.

Regarding claim 18, Watanabe et al discloses on figure 8 the step of forming the plurality of drain regions comprises the steps of forming a plurality of well regions 23s in the body of semiconductor material, and forming a drain contact region 24 in at least one of the plurality of well regions.

Regarding claim 20, Watanabe et al discloses on figure 8 the steps of forming the second conductive layer 30 includes forming a second conductive layer 30 wherein portions of the second conductive layer terminate in proximity to the first conductive layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al as applied to claim 1 above, and further in view of Ludikhuize.

Regarding claim 5, Watanabe et al discloses on figure 8 substantially all the structure set forth in the claimed invention except the first drain region comprising an elongated stripe shape. However, Ludikhuize discloses on figure 1 except the first drain region 7 comprising an elongated stripe shape. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Watanabe et al by having the first drain region comprising an elongated stripe

shape for the purpose of increasing the breakdown voltage at high currents, and thus an expansion of the safe operating area as taught by Ludikhuize (col. 2, lines 2-4).

Regarding claim 6, Watanabe et al discloses on figure 8 substantially all the structure set forth in the claimed invention except the first source region comprising an elongated stripe shape substantially parallel to the first drain region. However, Ludikhuize discloses on figure 1 the first source region 6 comprising an elongated stripe shape substantially parallel to the first drain region 7. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Watanabe et al by having the first source region comprising an elongated stripe shape substantially parallel to the first drain region for the purpose of increasing the breakdown voltage at high currents, and thus an expansion of the safe operating area as taught by Ludikhuize (col. 2, lines 2-4).

Allowable Subject Matter

Claims 9, 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (571) 272-1734. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm. If

attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications.

JN
October 15, 2004.

JEROME JACKSON
PRIMARY EXAMINER